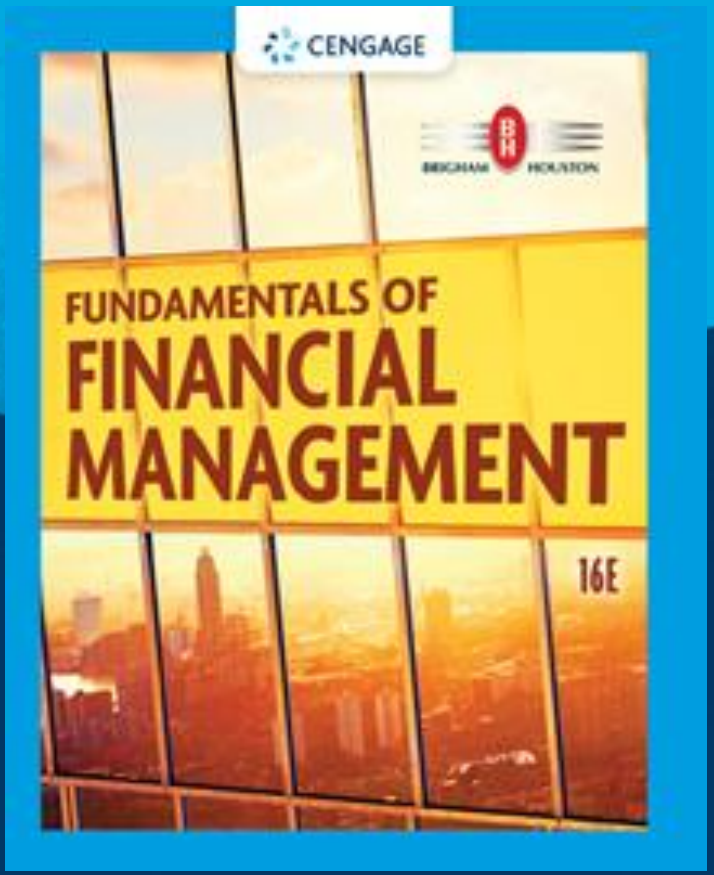
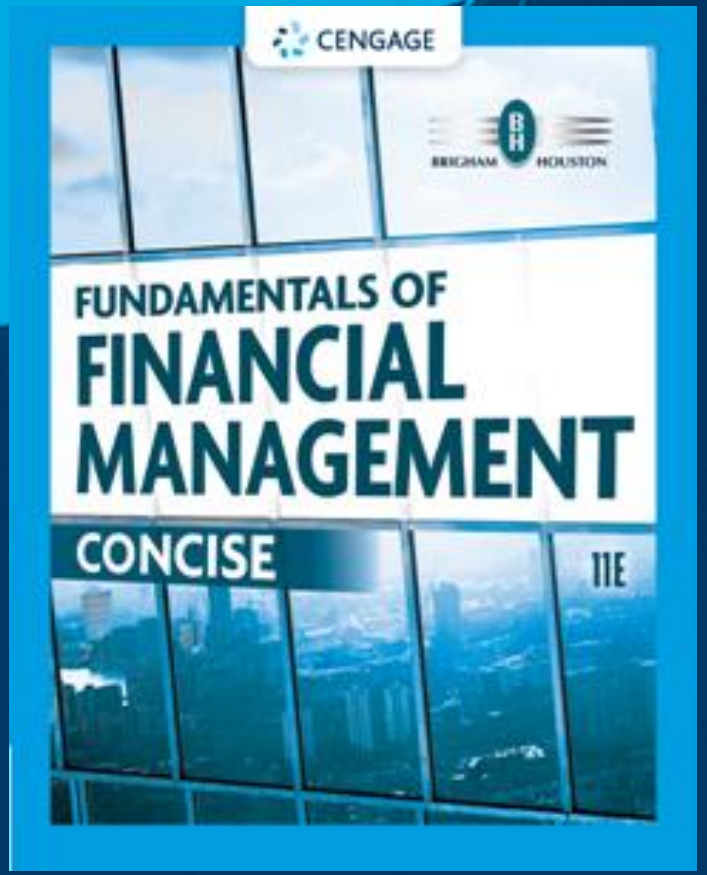




Chapter 9

Stocks and Their Valuation

Overview

- Features of Common Stock
- Intrinsic Value and Stock Price
- Determining Common Stock Values
- Discounted Dividend Model
- Corporate Valuation Model
- Other Approaches
- Preferred Stock

Facts About Common Stock

- Represents ownership
- Ownership implies control
- Stockholders elect directors
- Directors elect management
- Management’s goal: Maximize the stock price

Intrinsic Value and Stock Price

- Outside investors, corporate insiders, and analysts use a variety of approaches to estimate a stock's intrinsic value $(\hat{P}_0)$.
- In equilibrium we assume that a stock's price equals its intrinsic value.
  - Outsiders estimate intrinsic value to help determine which stocks are attractive to buy and/or sell.
  - Stocks with a price below (above) its intrinsic value are undervalued (overvalued).

Different Approaches for Estimating the Intrinsic Value of a Common Stock

Discounted dividend model

Corporate valuation model

Models based on market multiples

Discounted Dividend Model

- Value of a stock is the present value of the future dividends expected to be generated by the stock.

$$\hat{P}_0 = \frac{D_1}{(1+r_s)^1} + \frac{D_2}{(1+r_s)^2} + \frac{D_3}{(1+r_s)^3} + \ldots + \frac{D_\infty}{(1+r_s)^\infty}$$

Constant Growth Stock

- A stock whose dividends are expected to grow forever at a constant rate, g.

$$D_1 = D_0(1 + g)^1$$

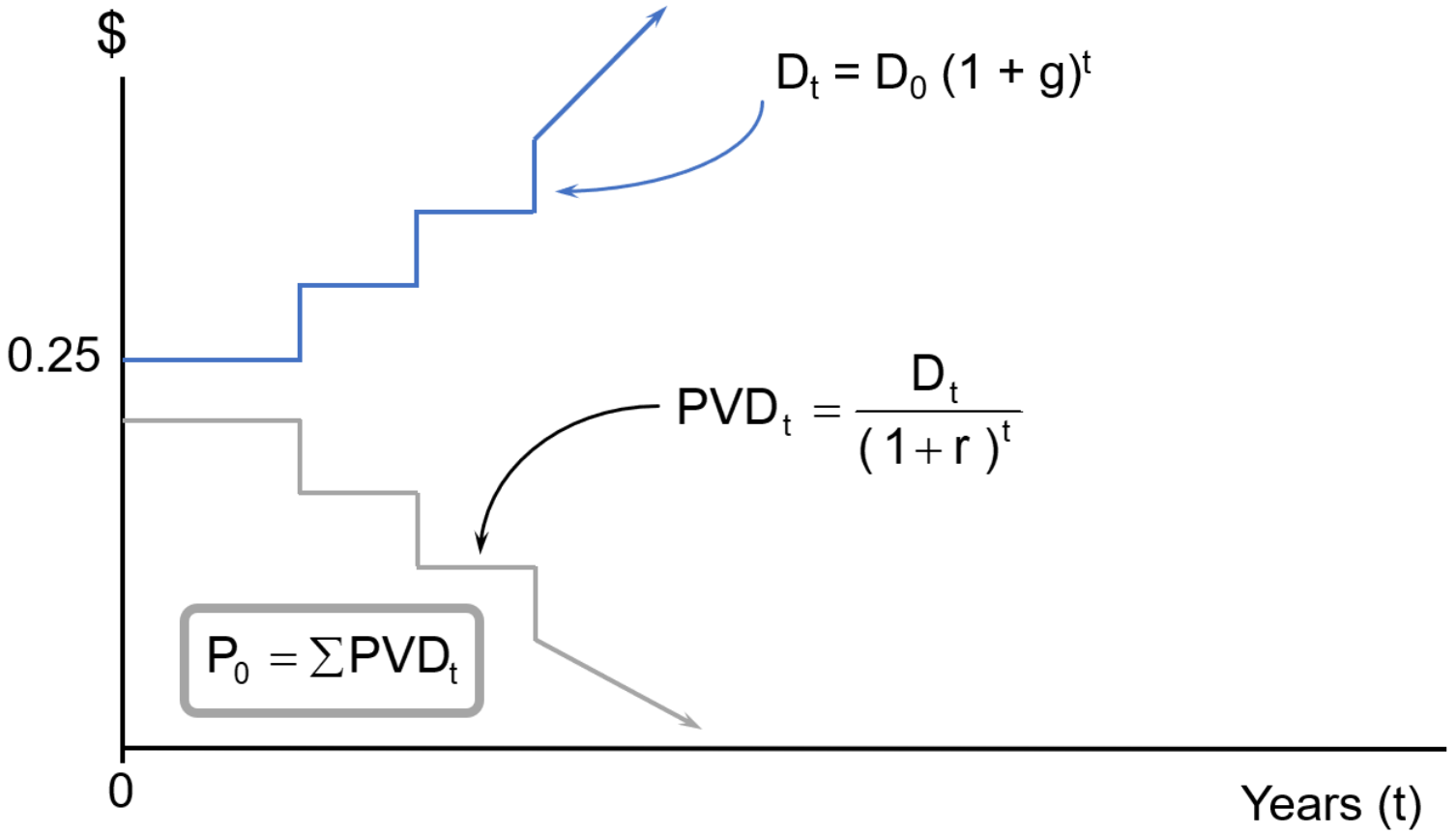
$$D_2 = D_0(1 + g)^2$$

$$D_t = D_0(1 + g)^t$$

- If g is constant, the discounted dividend formula converges to:

$$\hat{P}_0 = \frac{D_0(1+g)}{r_s - g} = \frac{D_1}{r_s - g}$$

Future Dividends and Their Present Values



What happens if $g > r_s$?

- If $g > r_s$, the constant growth formula leads to a negative stock price, which does not make sense.
- The constant growth model can be used only if:
  - $r_s > g$
  - g is expected to be constant forever.

Use the SML to Calculate the Required Rate of Return (r_s)

- If r_{RF} = 3%, r_M = 8%, and b = 1.2, what is the required rate of return on the firm's stock?

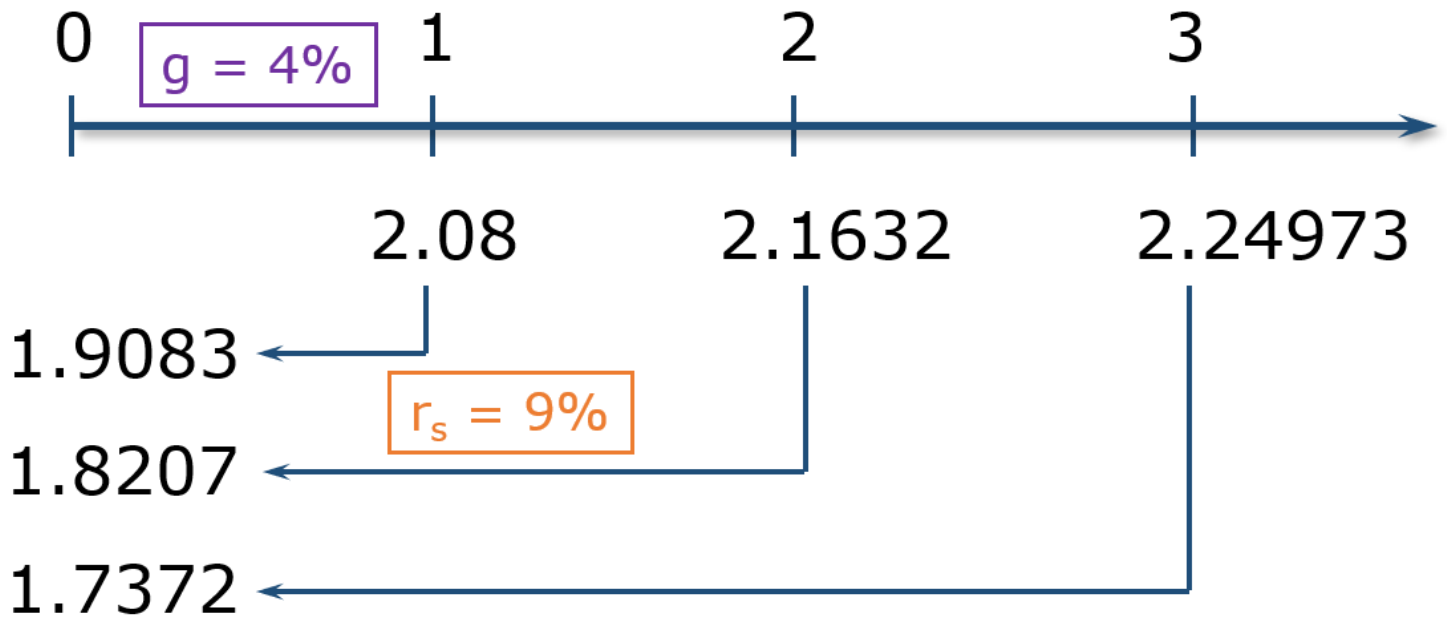
$$r_s = r_{RF} + (r_M - r_{RF})b$$

$$= 3\% + (8\% - 3\%)1.2$$

$$= 9\%$$

Find the Expected Dividend Stream for the Next 3 Years and Their PVs

D_0 = \$2 and g is a constant 4%.



What is the stock's intrinsic value?

- Using the constant growth model:

$$\hat{P}_0 = \frac{D_1}{r_s - g} = \frac{\$2.08}{0.09 - 0.04}$$

$$= \frac{\$2.08}{0.05}$$

$$= \$41.60$$

What is the stock's expected value, one year from now?

- D_1 will have been paid out already. So, expected P_1 is the present value (as of Year 1) of D_2, D_3, D_4, etc.

$$\hat{P}_1 = \frac{D_2}{r_s - g} = \frac{\$2.1632}{0.09 - 0.04}$$
$$= \$43.26$$

- Could also find expected P_1 as:

$$\hat{P}_1 = P_0(1.04) = \$43.26$$

Find Expected Dividend Yield, Capital Gains Yield, and Total Return During First Year

- Dividend yield

  $= D_1/P_0 = \$2.08/\$41.60 = 5.0\%$

- Capital gains yield

  $= (P_1 – P_0)/P_0$

  $= (\$43.26 – \$41.60)/\$41.60 = 4.0\%$

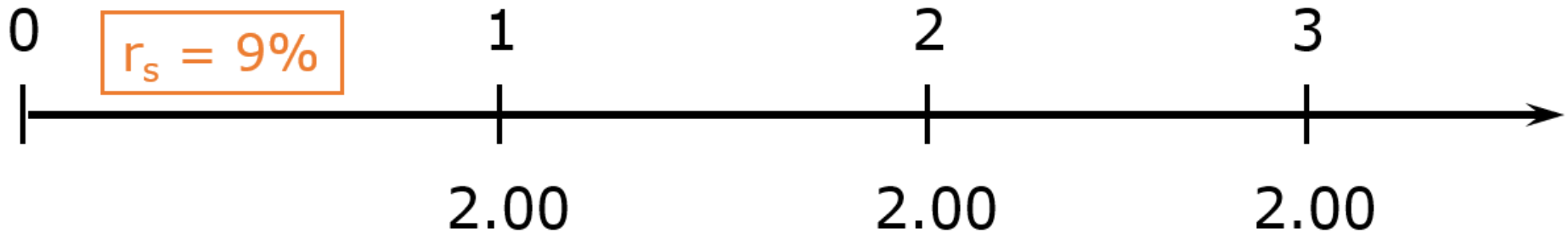
- Total return (r_s)

  = Dividend yield + Capital gains yield

  = 5.0% + 4.0% = 9.0%

What would the expected price today be, if g = 0?

The dividend stream would be a perpetuity.



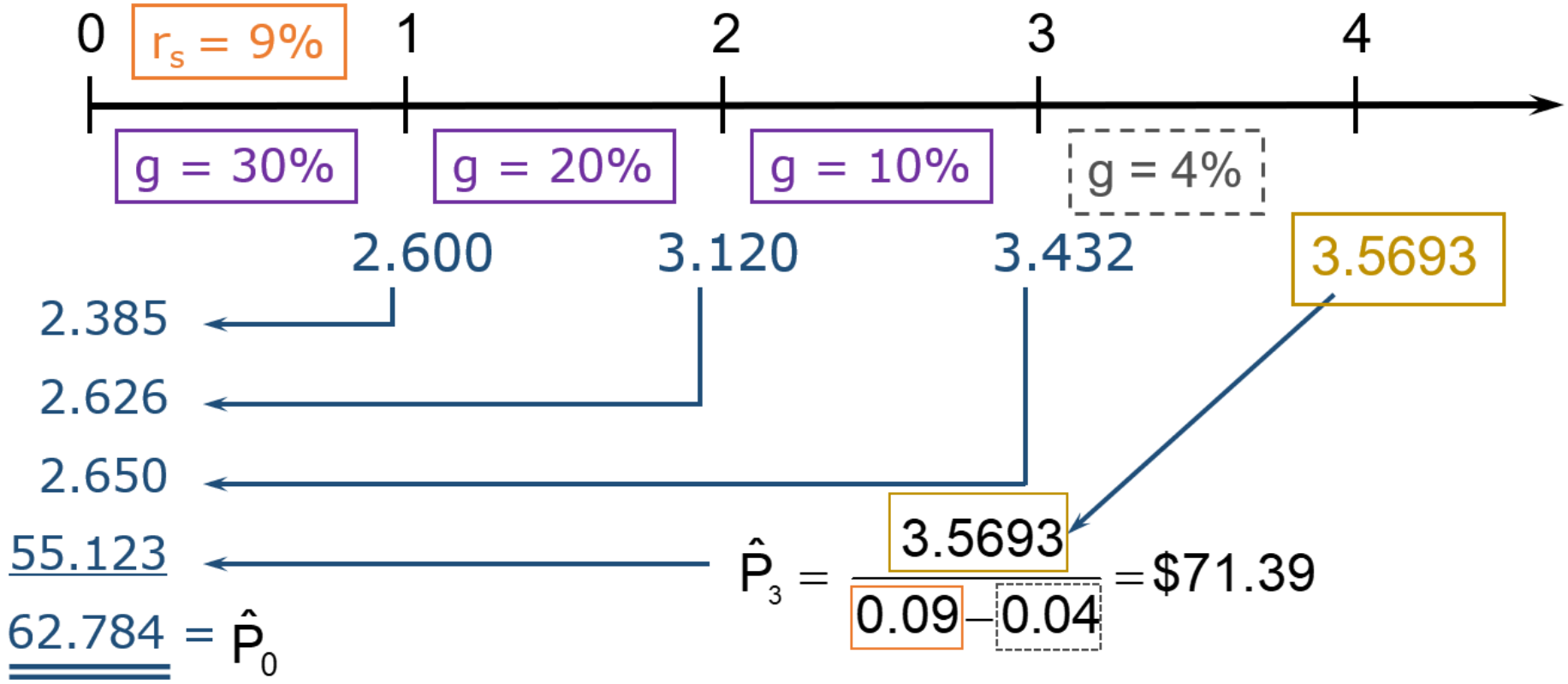
$$\hat{P}_0 = \frac{PMT}{r} = \frac{\$2.00}{0.09} = \$22.22$$

Supernormal Growth

- What if g = 30% for 1 yr., 20% for 1 yr., and 10% for 1 yr. before achieving long-run growth of 4%?
  - Can no longer use just the constant growth model to find stock value.
  - However, the growth does become constant after 3 years.

Valuing Common Stock with Nonconstant Growth

$D_0 = \$2.00$.



Find Expected Dividend and Capital Gains Yields During the First and Fourth Years (1 of 2)

- Dividend yield (first year)

  = $2.60/$62.78 = 4.14%

- Capital gains yield (first year)

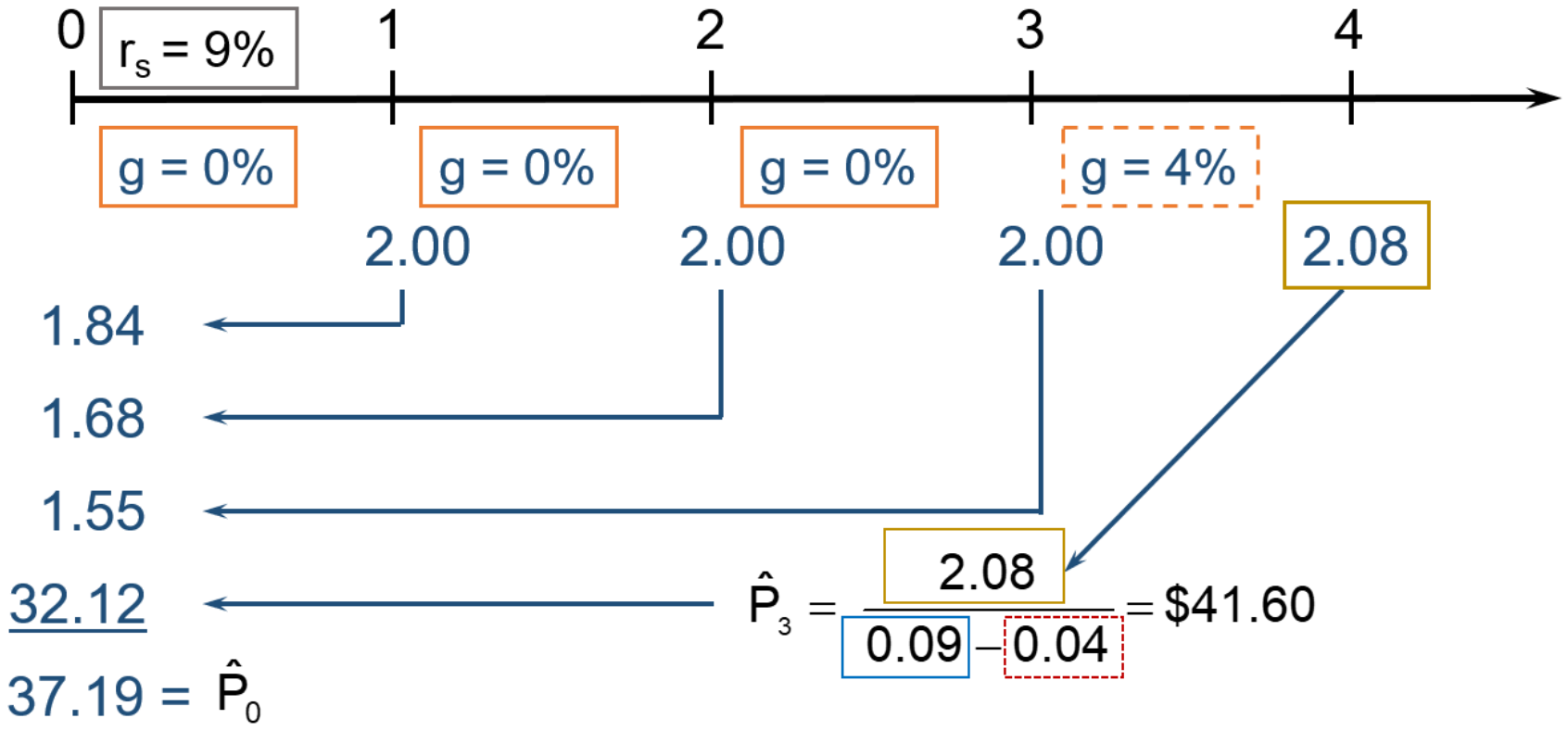
  = 9.00% – 4.14% = 4.86%

- During nonconstant growth, dividend yield and capital gains yield are not constant, and capital gains yield ≠ g.

- After t = 3, the stock has constant growth and dividend yield = 5%, while capital gains yield = 4%.

Nonconstant Growth: What if g = 0% for 3 years before long-run growth of 4%?

D_0 = \$2.00.



Find Expected Dividend and Capital Gains Yields During the First and Fourth Years (2 of 2)

- Dividend yield (first year)

  = $2.00/$37.19 = 5.38%

- Capital gains yield (first year)

  = 9.00% – 5.38% = 3.62%

- After t = 3, the stock has constant growth and dividend yield = 5%, while capital gains yield = 4%.

If the stock was expected to have negative growth (g = −4%), would anyone buy the stock, and what is its value?

- Yes. Even though the dividends are declining, the stock is still producing cash flows and therefore has positive value.

$$\hat{P}_0 = \frac{D_1}{r_s - g} = \frac{D_0(1+g)}{r_s - g}$$

$$= \frac{\$2.00\,(0.96)}{0.09 - (-0.04)} = \frac{\$1.92}{0.13} = \$14.77$$

Find Expected Annual Dividend and Capital Gains Yields

- Capital gains yield

  = g = –4.00%

- Dividend yield

  = 9.00% – (–4.00%) = 13.00%

- Since the stock is experiencing constant growth, dividend yield and capital gains yield are constant. Dividend yield is sufficiently large (13%) to offset negative capital gains.

Corporate Valuation Model

- Also called the free cash flow method. Suggests the value of the entire firm equals the present value of the firm's free cash flows (which is the MV of its operations) plus the market value of its non-operating assets.
- Remember, free cash flow is the firm's after-tax operating income less the net capital investment.

$$\text{FCF} = \left[\text{EBIT}(1-\text{T}) + \text{Depreciation and amortization}\right]$$
$$-\left[\text{Capital expenditures} + \Delta\text{NOWC}\right]$$

Applying the Corporate Valuation Model

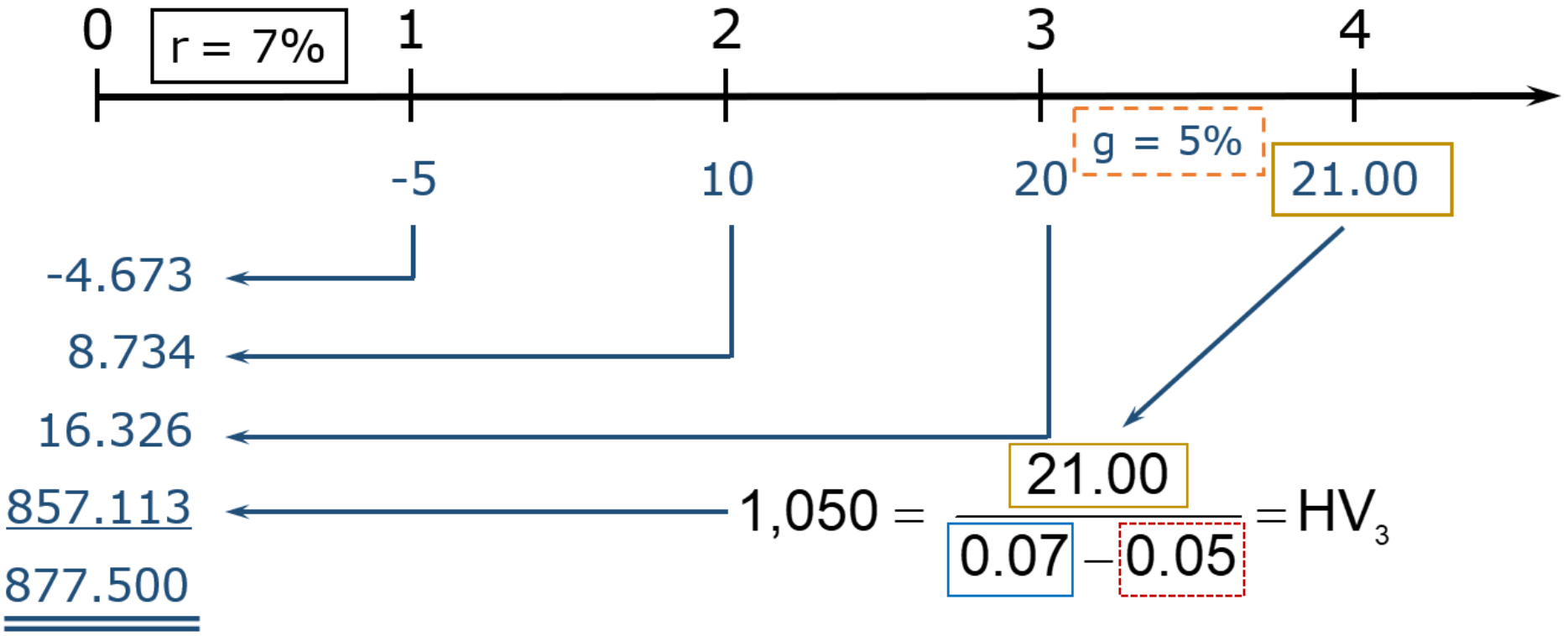
- Find the market value (MV) of the firm's operations, by finding the PV of the firm's future FCFs.
- Add the market value of the firm's non-operating assets.
- Subtract MV of firm's debt and preferred stock to get MV of common stock.
- Divide MV of common stock by the number of shares outstanding to get intrinsic stock price (value).

Issues Regarding the Corporate Valuation Model

- Often preferred to the discounted dividend model, especially when considering number of firms that don't pay dividends or when dividends are hard to forecast.
- Similar to discounted dividend model, assumes at some point free cash flow will grow at a constant rate.
- Horizon value (HV_N) represents value of firm's operations at the point that growth becomes constant.

Use the Corporate Valuation Model to Find the Value of the Firm's Operations

Given: Long-Run g_{FCF} = 5% and WACC = 7%



What is the firm's intrinsic value per share?

- The firm has $40 million total in debt and preferred stock, $5 million of non-operating assets, and 10 million shares of common stock.

$$\begin{aligned}\text{MV of equity} &= \text{MV of operations} + \text{MV of nonoperating assets} - \text{MV of debt and preferred} \\ &= \$877.50 + \$5 - \$40 \\ &= \$842.50 \text{ million}\end{aligned}$$

$$\begin{aligned}\text{Value per share} &= \text{MV of equity/\# of shares} \\ &= \$842.50/10 \\ &= \$84.25\end{aligned}$$

Firm Multiples Method

- Analysts often use the following multiples to value stocks.
  - P/E
  - P/CF
  - P/Sales
- EXAMPLE: Based on comparable firms, estimate the appropriate P/E. Multiply this by expected earnings to back out an estimate of the stock price.
- Enterprise-Based Multiples
  - EV/EBITDA

Preferred Stock

Hybrid security

Like bonds, preferred stockholders receive a fixed dividend that must be paid before dividends are paid to common stockholders.

However, companies can omit preferred dividend payments without fear of pushing the firm into bankruptcy.

If preferred stock with an annual dividend of $5 sells for $100, what is the preferred stock's expected return?

$$V_p = \frac{D}{r_p}$$

$$\$100 = \frac{\$5}{r_p}$$

$$\hat{r}_p = \frac{\$5}{\$100}$$

$$= 0.05 = 5\%$$